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54) Title of the Invention: Vine Plant Support

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Detailed Statement

1. Title of the Invention
   Vine Plant Support

2. Scope of Patent Claims
   1. A vine plant support which is characterized by its L-shaped bottom part and high rigidity

3. Detailed Description of the Invention
   [Industrial Field of Application]
   This Invention is related to the manufacture of a support, which renders support to vines of plants such as the morning glory, ivy, and Malabar nightshade, especially to vine plants that are grown in pots or planters.

[Prior Art]

It is the nature of vine plants to grow long around other plants' stalks or tree trunks or toward rocks or the ground.

To grow these vine plants, sticks, trellises, or ropes are normally used for support instead of said stalks or tree trunks.

As many vine plants have relatively weak roots for such rigorous upward growth, they are not suitable for growing in pots or planters with the assumption that they are going to be transplanted later. Thus, unless very strong supports are used, they should be planted in the ground.

[Problems to be Solved by the Invention]

Vine plants grown in pots/planters, if it is easy to do so, can offer a new idea of growing beautiful vine plants such as the ivy and Malabar nightshade indoors.

However, the problem of using vine supports that are currently available, whether they are sticks that have to planted in the ground one at a time or trellises that provide horizontal connection to the vertically planted sticks, is that plants often get damaged when pots/planters are moved; the roots in the ground and stalks that are attached to the supports get loose.

In addition, unlike those plants that are grown directly in the ground, potted plants often require transplanting as they grow in size. In such a case, unlike those plants that stand up by themselves, vine plants are considerably difficult to transplant due to problems such as breaking the stems or vines unless the supports and roots [? illegible] are removed together.

For the reasons described above, there was always a big need for vine plant supports of this kind.

[Means for Solving the Problem]

The inventor listed above has invented vine plant supports that solve said problems after [illegible] research [illegible]. This Invention is characterized by its L-shaped bend at the bottom and high rigidity.

"Vine Plants" here mean those plants that need to depend on other things while growing upward or horizontally. "Other Things" here mean the earth surface, rocks, tree trunks, etc., and the supports needed for vine plants' growth period are considered to be the substitution for these "Other Things".

"L-shape" means a shape that has a bent part that is almost perpendicular to the direction of the support insertion (vertical direction). However, in reality, it can include a shape without a bend (a vertical part curves to make a horizontal part) or a shape with a bend, whose angle is not exactly 90 degrees, or a T-shape. Furthermore, only some of the vertical part is in the ground, with the rest above the ground, while the entire horizontal part is in the ground, but the length of each part is not limited to certain dimensions. In other words, the vertical length of This Invention will depend on the kinds of plants that grow and extent of growth, and the horizontal length is determined by the size of the pot or planter. However, if the pot/planter used has predetermined dimensions, it would be preferable to make the shape of This Invention to fit the inner walls and bottom surface of the pot/planter and to use This Invention so that they touch said inner walls and surface. This is due to the fact that the stability of This Invention is further enhanced when the vertical part of This Invention touches the inner walls and the horizontal part touches the bottom surface of the pot/planter. In other words, when a plant support or This Invention is fit into a pot/planter and soil is poured over said support, the pot/plant and support become one unit, rendering more stability against factors such as wind. It should be mentioned that having a support that touches the inner walls of a pot/planter provides an additional benefit of easier plant management (irrigation, fertilization, etc.); it is easy to see the soil surface or the plant roots when the vines and leaves grow around the support and make a piece of panel, for said support is placed only on one side of the pot/planter, including the part that is showing above the soil. Furthermore, in addition to the kind that fits the inner shape of a pot/planter, plant supports that touch the inner walls of pots/planters include plant supports that have protrusions near the bend or the vertical part of the L-shaped supports (refer to Embodiments for detail).

"High rigidity" means that plant supports can support vine plants well and that they maintain their "L-shape" well. This can be achieved by providing enough rigidity to said supports so that the angle [? illegible] of the bend does not change easily due to a certain level of outside force and that the relative positioning of roots and leaves does not change enough to affect the growth of plants if said supports get tilted.

Except for their L-shaped bottom part, the structure of these plant supports is not different from that of other conventional rigid plant supports. Therefore, This Invention may include single stick-like supports, board-shaped supports, or supports with lined-up sticks.

With regard to This Invention, it is preferable to place a plant support before soil is poured into a pot/planter, for it is difficult to place said plant support after soil and a vine plant go into the pot/planter. Therefore, the breadth and height of the plant support should be determined when the nature of said vine plant has been understood. In addition, users of This Invention should take transplanting of vine plants into account, for potted plants generally require transplanting as they grow. This Invention makes transplanting surprisingly easy as the L-shaped bottom part helps take out the roots and stalks without changing their relative positioning.

[Embodiments]

This Invention is described in more detail, using the following drawings.

Drawing 1 shows This Invention or Vine Plant Support (1) (referred to as the "This Invention or Plant Support (1)" hereinafter) or one embodiment of This Invention. As shown in Drawing 1, this plant support is made of multiple bars (2) that are spread wide apart in a [illegible] and bent at the bottom part, making an L-shape when observed from the side.

Drawings 2 (a) and 2 (b) are schematic drawings of This Invention or Plant Support (1) when it is in use.

First, place This Invention or Plant Support (1) in a rectangular-shaped planter (3) and pour in soil (4) as shown in Drawing 2 (a).

Plant seeds or saplings in the soil (not shown in drawings).

When the roots, leaves, vines, etc. grow, they coil around the plant support and make a solid potted plant. The leaves and vines coiled around This Invention or Plant Support (1) results in providing a panel-like appearance as shown in Drawing 2 (b).

During the transplanting process, rock This Invention or Plant Support (1), using hands, etc., and take the vine plant (5) out of the planter (3) as if peeling hardened soil (4) off the planter (3).

It needs to be mentioned that This Invention or Plant Support (1) shown here does not fit the size or dimension of the planter (3) and that said plant can be more solidified if a plant support in the length of the planter is used instead, although rocking or shifting of said Support can be prevented by pouring soil (4) on top. Drawings 3 (a) and 3 (b) show such examples; Drawing 3 (a) shows an L-shaped support whose length of the horizontal part fits the dimension of the planter bottom and whose vertical part is fit into the shape of the planter's inner wall (3). Drawing 3 (b) shows a plant support with Protrusions (11) which have been obtained by bending bars at the top part of the planter and other Protrusions (12) which have been obtained also by bending bars at the bend. In any case, This Invention or Plant Support (1) increases its retainability to the maximum when it is has contact with the inside wall of the planter (3), at the top (area shown as A), and both edges of the bottom of the planter (areas shown as B and C). However, when it has contact with the planter (3) at 2 points only, A and C for example, its retainability still increases considerably even if it does not have contact at 3 points.

Drawing 4 is an example of This Invention or Plant Support (1) that uses a net (6) to catch vines instead of bar materials as shown in Drawing 1. The nature of each vine should determine which type of support should be used: the net type or the bar-type.

[Effects of the Invention]

As described above in detail, This Invention or Plant Support is characterized by having an L-shaped bend at the bottom and high rigidity. It is a high-technology invention that provides the following merits:

1) After pouring soil on top, this L-shaped support does not come out of a planter or get lopsided easily.
2) If a plant support is [illegible] against a planter (ex. when a force is applied to the top part of the support by mistake in the horizontal direction), the L-shaped bottom helps minimize plant damage as the entire soil containing the roots move.
3) It makes the transplanting process easy, for the L-shaped bottom of the support helps the roots and soil come out together with the support part that the vines and leaves are coiled around.

4. Brief Description of the Drawings

Drawing 1 shows an embodiment of This Invention or Plant Support for vine plants. Drawings 2 (a) and (b) show the direction for use and a schematic cross section view for This Invention. Drawings 3 (a) and (b) show other embodiments of This Invention, showing the schematic cross section view for both of them. Lastly, Drawing 4 shows the diagonal view of yet another embodiment of This Invention.

1. Vine Plant Support
2. Bars
3. Planter/Pot
4. Soil
5. Vine Plant
6. Net
11. Protrusion(s)
12. Protrusion(s)

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Drawing 1

(a)

Drawing 2

(b)

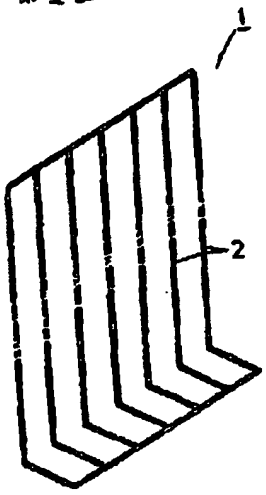
Drawing 3

(a)

(b)

Drawing 4

第1図



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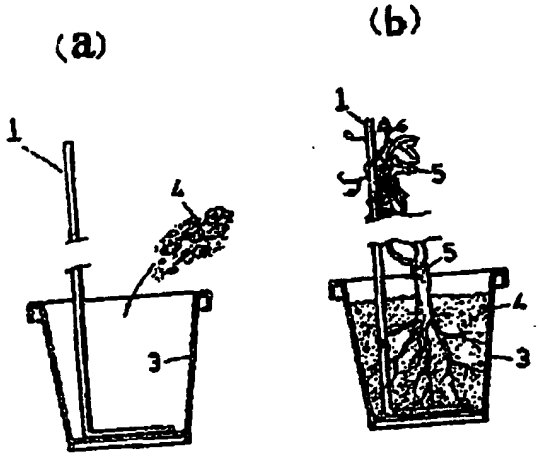
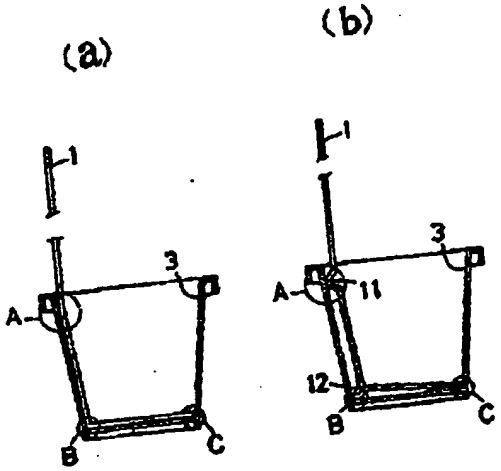


第3図



第4図